



HIH-4000-002



Actual product appearance may vary.

HIH-4000 Series integrated circuit humidity sensor, 1,27 mm [0.050 in] lead pitch SIP

Features

- Molded thermoset plastic housing
- Near linear voltage output vs % RH
- Laser-trimmed interchangeability
- Enhanced accuracy, fast response
- Fast response time
- Stable, low drift performance
- Chemically resistant

Potential Applications

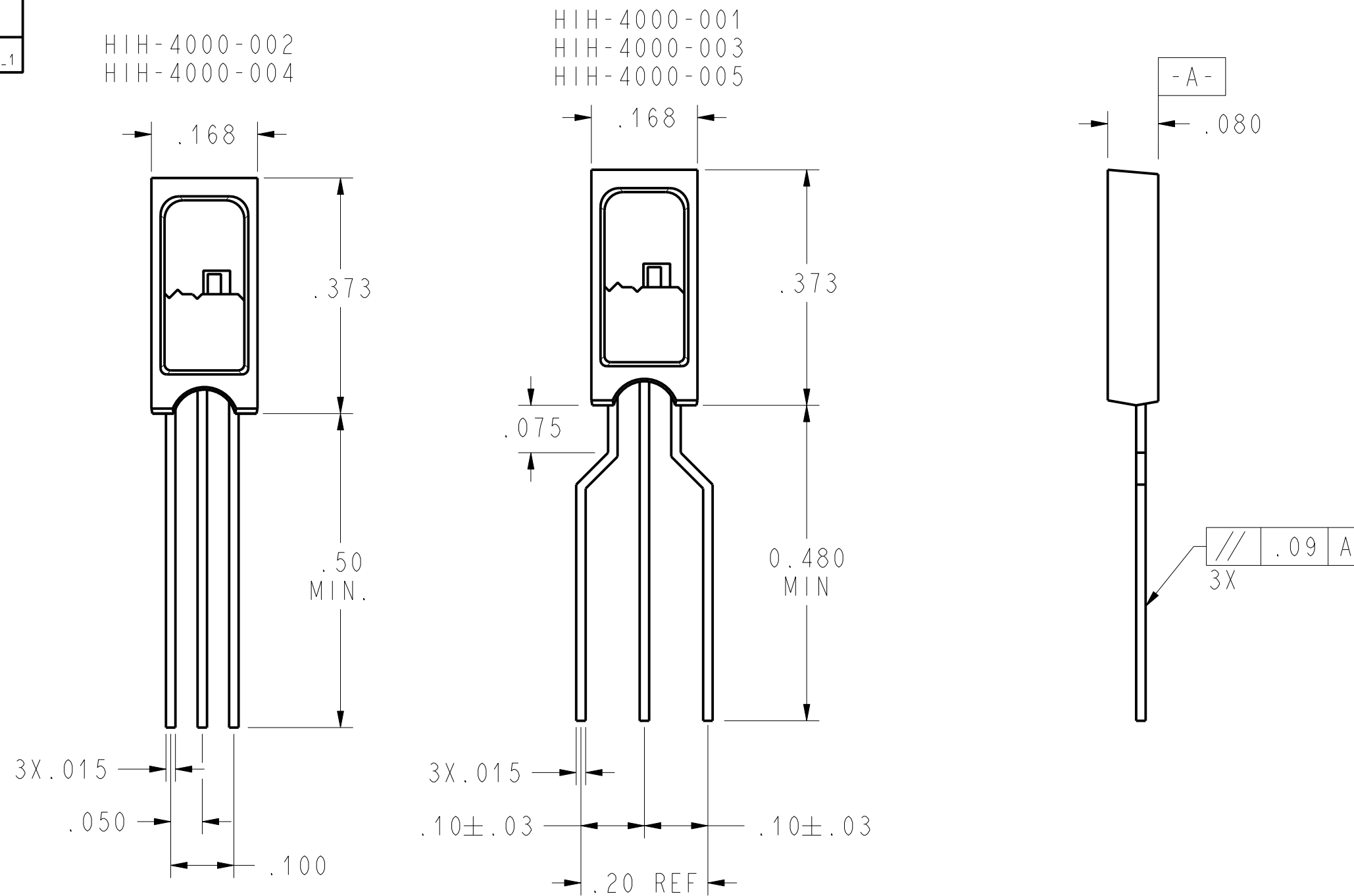
- Refrigeration equipment
- HVAC equipment
- Medical equipment
- Drying
- Meteorology
- Battery-powered systems
- OEM assemblies

Description

The HIH-4000 Series Humidity Sensors are designed specifically for high volume OEM (Original Equipment Manufacturer) users. Direct input to a controller or other device is made possible by this sensor's near linear voltage output. With a typical current draw of only 200 μ A, the HIH-4000 Series is often ideally suited for low drain, battery operated systems. Tight sensor interchangeability reduces or eliminates OEM production calibration costs. Individual sensor calibration data is available. The HIH-4000 Series delivers instrumentation-quality RH (Relative Humidity) sensing performance in a competitively priced, solderable SIP (Single In-line Package). Available in two lead spacing configurations, the RH sensor is a laser trimmed, thermoset polymer capacitive sensing element with on-chip integrated signal conditioning. The sensing element's multilayer construction provides excellent resistance to most application hazards such as wetting, dust, dirt, oils and common environmental chemicals.

Product Specifications	
Package Type	1,27 mm [0.050 in] lead pitch SIP
Operating Temperature Range	-40 °C to 85 °C [-40 °F to 185 °F]
Operating Humidity Range	0% RH to 100% RH
Interchangeability	0% RH to 59% RH \pm 5%, 60% RH to 100% RH \pm 8%
Hysteresis	3% RH
Response Time	15 s 1/e in slow moving air
Repeatability	\pm 0.5% RH
Settling Time	70 ms max.

Max. Supply Voltage	5.8 Vdc
Max. Supply Current	500 μ A
Stability at 50% RH	$\pm 1.2\%$ RH
Output Signal	Analog voltage
Covered Device	No
Moisture/Dust Filter	No
Combined Humidity and Temperature Sensor	No
Calibration and Data Printout	No
Series Name	HIH-4000
Availability	Global



PRODUCT DESCRIPTION	
CATALOG LISTING	DESCRIPTION
HIH-4000-001	INTEGRATED CIRCUIT HUMIDITY SENSOR, 0.100 IN LEAD PITCH SIP
HIH-4000-002	INTEGRATED CIRCUIT HUMIDITY SENSOR, 0.050 IN LEAD PITCH SIP
HIH-4000-003	INTEGRATED CIRCUIT HUMIDITY SENSOR, 0.100 IN LEAD PITCH SIP WITH CALIBRATION AND DATA PRINTOUT
HIH-4000-004	INTEGRATED CIRCUIT HUMIDITY SENSOR, 0.050 IN LEAD PITCH SIP WITH CALIBRATION AND DATA PRINTOUT

OPERATING CHARACTERISTICS
at 5.0 VDC AND 25°C UNLESS OTHERWISE NOTED

SPECIFICATION	MIN	TYP	MAX	UNIT
INTERCHANGEABILITY				
0 to 60%RH	-5		5	% RH
60% to 100%RH	-8		8	% RH
ACCURACY, (BFSL)		±3.5		% RH
ACCURACY, (2nd ORDER CURVE)		±2.5		% RH
HYSTERESIS		3		% RH
REPEATABILITY		±0.5		% RH
SETTLING TIME			70	mS
RESPONSE TIME, 1/e IN SLOW MOVING AIR		15		Sec.
STABILITY, AT 50%RH IN 1 YEAR		1.2		% RH
POWER REQUIREMENTS				
VOLTAGE SUPPLY	4		5.8	VDC
CURRENT SUPPLY			500	µA
VOLTAGE OUTPUT, 2nd ORDER CURVE FIT	$V_{out} = 0.00003(\text{SENSOR RH})^2 + 0.0281(\text{SENSOR RH}) + 0.820$, TYP at 25°C			
TEMPERATURE COMPENSATION	$V_{out} = (0.0305 + 0.000044T - 0.0000011T^2)(\text{SENSOR RH}) + (0.9237 - 0.0041T + 0.000040T^2)$, T=TEMPERATURE IN °C			
OPERATING TEMPERATURE	-40	SEE CHART	85	°C
OPERATING HUMIDITY	0	SEE CHART	100	% RH
STORAGE TEMPERATURE	-50		125	°C
STORAGE HUMIDITY		SEE CHART		% RH

DATA PRINTOUT (EXAMPLE)	
MODEL	HIH-4000-001
CHANNEL	92
WAFER	030996M
MRP	337313
CALCULATED VALUES AT 5 V	
Vout @ 0% RH	0.958 V
Vout @ 75.3% RH	3.268 V
LINEAR OUTPUT FOR 2% RH ACCURACY @ 25 °C	
ZERO OFFSET	0.958 V
SLOPE	30.680 mV/%RH
RH	(Vout-ZERO OFFSET)/SLOPE (Vout-0.958)/0.0307
RATIOMETRIC RESPONSE FOR 0 TO 100% RH	
Vout	Vsupply (0.1915 TO 0.8130)

- NOTES
- 1 - DEVICE IS CALIBRATED AT 5 VDC AND 25°C
 - 2 - NONCONDENSING ENVIRONMENT
 - 3 - CROSS-HATCHED OPERATING ZONE LIMITED TO <50 HOURS
 - 4 - NO SPECIFICATION ZONE
 - 5 - DEVICE IS RATIOMETRIC TO SUPPLY VOLTAGE
 - 6 - EXTENDED EXPOSURE TO >=90% CAUSES A REVERSIBLE SHIFT OF 3% RH
 - 7 - THIS SENSOR IS LIGHT SENSITIVE AND SHOULD BE SHIELDED FROM BRIGHT LIGHT TO ACHIEVE BEST PERFORMANCE



DESIGN UNITS: INCH TOLERANCES UNLESS NOTED:	DRAWN: NSD 29APR04 CHECK: AK 29APR04	Honeywell	
NO PLACE X ± 0.040 ONE PLACE .X ± 0.030 TWO PLACE .XX ± 0.015 THREE PLACE .XXX ± 0.005 FOUR PLACE .XXXX ± 0.0005 ANGLES X ± 2	THIS DRAWING COVERS A PROPRIETARY ITEM AND IS THE PROPERTY OF HONEYWELL. THIS DRAWING IS NOT TO BE COPIED OR USED WITHOUT THE PERMISSION OF HONEYWELL.		
THIRD ANGLE PROJECTION	INTERPRET PER ASME Y14.5M-1994 OTHER HONEYWELL ENGINEERING STANDARDS MAY APPLY	SIZE: C SCALE: 3:1	DRAWING NAME: HIH-4000 SERIES CHART 1 REV: A
	Pro/ENGINEER 3D	SHEET: 1 OF 2	

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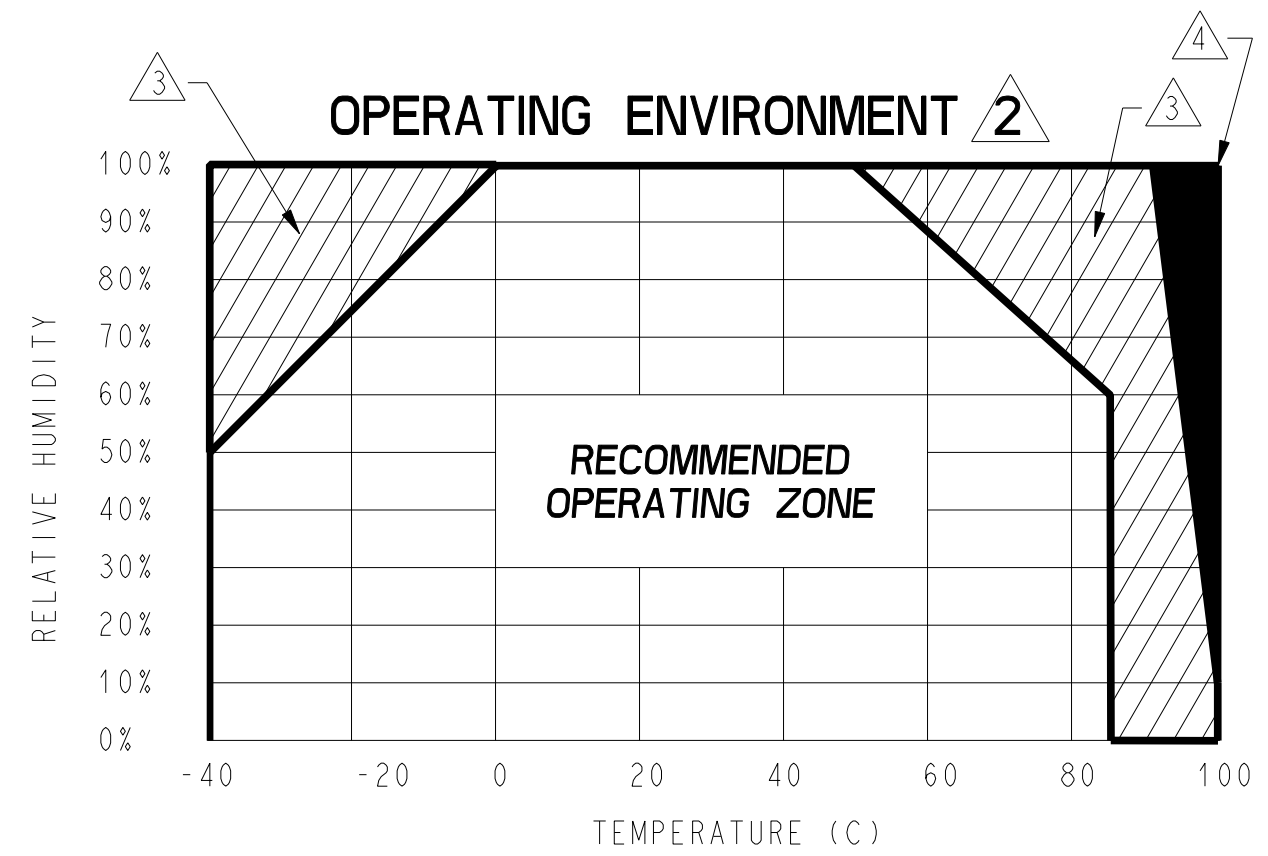
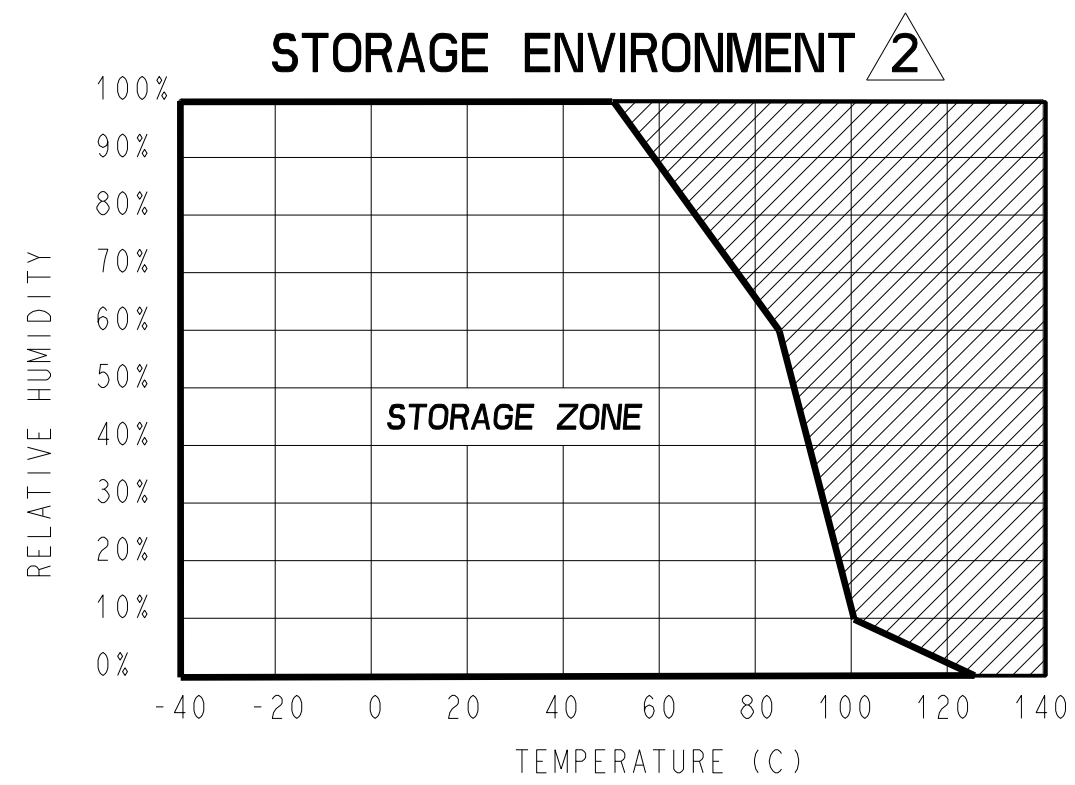
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		SIZE	DWG TYPE	DRAWING NAME	REV
		C	I	HIH-4000 SERIES CHART 1	A
SCALE		3:1	SHEET 2 OF 2		